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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,862

05/12/2006

Petrus A Van Nijnatten

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11/28/2007

NIXON & VANDERHYE, PC  
901 NORTH GLEBE ROAD, 11TH FLOOR  
ARLINGTON, VA 22203

EXAMINER

GUGLIOTTA, NICOLE T

ART UNIT

PAPER NUMBER

4174

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,862	<b>Applicant(s)</b> VAN NIJNATTEN, PETRUS A	
	<b>Examiner</b> Nicole T. Gugliotta	<b>Art Unit</b> 4174	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 - 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/23/2007, 2/7/2006, 1/9/2006</u> .                           | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Examiner's Note***

1. Claim 2 does not specify as to whether the thickness of the coating is an optical thickness or a geometrical thickness. Based upon the specification examiner takes the position claim 2 refers to the geometrical thickness.

### ***Claim Objections***

2. Claim 9 is objected to because of the following informalities: The term “preferably” is interpreted as being indefinite in that it fails to point out what is included or excluded by the claim language. This is an improper Markush group (see MPEP 2173.05(h)). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 7 – 9 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This is an improper Markush group (see MPEP 2173.05(h)). One does not

know the scope of the claims. Examiner takes the position claims 7 - 9 are "consisting of".

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 – 13, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Biornard (U.S. Patent No. 5,091,244).

7. In regard to claim 1, applicant claims an emission enhancing coating for a surface, which coating comprises at least one electrically conductive transparent film and at least two non-conductive films, wherein the conductive and non-conductive films have been applied alternatively on top of one another.

Biornard discloses an anti-reflective multilayer coating comprising alternating layers of electrically conductive and non-conductive films (Table 3, Figure 3, Column 8, Lines 33 - 36).

A multilayered coating on a surface, with alternating layers of conductive and non-conductive has antireflective properties. Emission can only occur as a result of the absorption of radiation by the surface. The total radiation is that which has been

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absorbed and reflected by a surface. Therefore if a coating minimizes does not reflect radiation, there is an increase in absorbed radiation, which in turn produced in increase in emitted radiation. Therefore an anti-reflective coating would increase the emission of radiation from a surface with an anti-reflective coating applied. Anti-reflective coatings are comprised of multilayered films of alternating conductive and non-conductive layers, which are common in the art.

8. In regard to claim 2, applicant claims the total thickness of the coating is smaller than the wavelength of radiation to be emitted by the surface.

Biornard discloses a total coating thickness of 156.5 nm in Table 1. In all computations, the layer systems have been optimized to yield the lowest possible reflection in the wavelength range from about 425 nm to about 675 nm (Column 8, Lines 28 – 32).

Each of these layers had a thickness of one quarter of the wavelength or less, which means based on the commonly accepted principle of quarter wavelengths in anti-reflective coatings, any reflecting radiation waves would have been cancelled out by destructive interference, and therefore it is assumed 100% of the radiation is transmitted through the coating and absorbed by the surface article, which would then be emitted.

9. In regard to claims 3 – 5, applicant claims the total thickness of the coating is at most 5 micrometers (as well as at most 20 micrometers and 100 micrometers).

Biornard discloses in Table 3 an embodiment of a multilayered coating with thicknesses of the layers corresponding to 75.2 nm, 12.7 nm, 48.7 nm and 20.9 nm. The sum of these layers creates a coating thickness of 157.5 nm, which is equal to 0.157 micrometers.

Anti-reflective (emission enhancement) coatings are commonly found to be less than 5 micrometers, as shown by Biornard.

10. In regard to claims 6 - 7, applicant claims the electrically conductive film comprises a metal chosen from the group of chrome, nickel and rhodium.

Biornard discloses that chromium is a common metal in anti-reflective coatings. Chromium films have a relatively low value of  $k/n$  are not highly reflective and are strongly light absorbing (Column 2, Lines 44 –46, Table 2).

11. In regard to claims 8 – 9, applicant claims the electrically transparent film comprises a semiconductor chosen from a group of doped metal oxides, conductive nitrides and carbides, preferably, tin-doped indium oxide, fluorine-doped tin oxide and aluminum-doped zinc oxide.

Biornard discloses it to have been well known in the art at the time the invention was made that electrically-conductive, transparent films, such as indium tin oxide, may be used in such coatings (Column 2, Lines 9 – 10).

For the purpose of an emission enhancing/antireflective coating, indium tin oxide and tin-doped indium oxide are the same.

12. In regard to claim 10, applicant claims each of the electrically conductive and non-conductive films is transparent.

Biornard discloses that the first and outermost film 20 is substantially transparent to light (non-conductive film, Column 7, Lines 61 – 62), as well as film 26 (also non-conductive film, Column 7, Lines 65 –66).

13. In regard to claims 11 – 12, applicant claims the non-conductive film comprises a non-conductive comprises a non-conductive material chosen from the group of non-conductive metal oxides, metal fluorides, metal carbides and metal nitrides, specifically silicon oxide.

Biornard discloses the metal film to be in contact with a transparent dielectric (non-conductive) material, such as magnesium fluoride or silicon dioxide (Column 2, Lines 19 – 21, Table 3, Figure 3).

14. In regard to claim 13, applicant claims an article with a surface with a low emissivity to which an emission enhancement coating has been applied.

Biornard discloses the application of antireflection coating to articles such as sunglasses, solar control glazings, and contrast enhancement filters.

15. Claims 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biornard.

16. In regard to claims 14 and 19, applicant claims an article and method wherein as a first film, a non-conductive transparent film has been applied to the surface.

Biornard discloses a transparent non-conductive film, which alternates with a conductive film to create an antireflective coating. Biornard discloses the first film of  $\text{SnO}_2$  (not doped), in direct contact with the supporting article (glass), to be the non-conductive film.

17. In regard to claim 18, applicant claims a method for applying an emission enhancing coating to a surface, wherein the conductive and non-conductive films have been applied alternately on top of one another to the surface.

Biornard discloses a preferred method of depositing these films is by DC reactive sputtering of the metal in an atmosphere including nitrogen or ammonia. Films may also be deposited by chemical vapor deposition (Column 5, Line 66 – Column 6, Line 1).

18. Claim 15 is rejected under 35 U.S.C. 102(b) as being unpatentable over Kaneko et al. (U.S. Patent No. 5,521,202).

19. Applicant claims a metal foil to which a coating according to claim 1 has been applied.

20. Kaneko et al. disclose in Figure 1 an interference layer, a recording layer, and a reflection layer are successively overlaid on a pregrooved surface of a transparent substrate. On the surface of the other side of the substrate, specifically, the surface at which a recording or reproduction laser beam enters, an anti-reflection layer is formed. This anti-reflection layer is of a three-layered type, which is composed of a first transparent insulating film layer, a transparent electroconductive film layer, and a second transparent insulating film layer, which are successively overlaid on the substrate (Column 2, Lines 48 – 60).

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biornard, in view of Coleman (U.S. Patent No. 4,226,897).

23. Applicant claims a solar cell to which an emission enhancing coating has been applied.

Biornard discloses the application of an antireflection coating to articles such as sunglasses, solar control glazings, and contrast enhancement filters. Biornard does not disclose the specific application of the coating to a solar cell.

Coleman discloses a solar cell containing a semi-conductor, which comprises an antireflection layer such as  $\text{Si}_3\text{N}_4$  with a thickness range of about 1000 Å may be applied to the electrode to reduced reflection loss under photon irradiation (Column 4, Lines 21 – 24).

It would have been obvious to one skilled in the art at the time the invention was made that the anti-reflective coating disclosed by Biornard could be applied to a solar cell, as it is known in the art that antireflective coatings are applied to semiconductors in solar cells.

24. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biornard, in view of Dvorkis et al. (U.S. Patent No. 5, 923,021).

25. Applicant claims a light reflector to which an emission enhancing coating has been applied.

Biornard discloses the application of an antireflection coating to articles such as sunglasses, solar control glazings, and contrast enhancement filters. Biornard does not disclose the specific application of the coating to a light reflector.

Dvorkis et al. disclose an antireflective coating present on the front surface of the diffuser of a light reflector (Column 9, Lines 41 – 42 and Lines 56 – 57) .

It would have been obvious to one skilled in the art at the time the invention was made to apply an antireflective coating to a diffuser of a light reflector, as it known in the art, as disclosed by Dvorkis et al.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole T. Gugliotta whose telephone number is 571-270-1552. The examiner can normally be reached on M - F (first Friday off) 7:30 a.m. - 5 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gwendolyn Blackwell/  
Primary Examiner, AU 1794

Nicole T. Gugliotta  
Examiner  
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